

Payday Loan Rollovers and Consumer Welfare

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Abstract

Using payday-lender administrative data matched to borrower credit attributes from a national credit bureau, I find that borrowers who engage in protracted refinancing (“rollover”) activity have better financial outcomes (measured by changes in credit scores) than consumers whose borrowing is limited to shorter periods. These results are robust to an alternative definition of a “rollover” that ignores out-of-debt periods of 14 days between successive loans. Also, exploiting interstate differences in rollover regulation, I find that, while regulation has a small effect on longer-term usage patterns, consumers whose borrowing is less restricted by regulation fare better than consumers in the most restrictive states, controlling for initial financial condition. These findings directly contradict key assumptions about this market, raise significant policy questions for federal regulators, and suggest the appropriateness of further study of actual consumer outcomes before the imposition of new regulatory rollover restrictions.

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Payday Loan Rollovers and Consumer Welfare

1. Introduction

Payday loans are small-dollar, short-term consumer loans at high interest rates. A typical loan is for \$300 for a term of two weeks, with a finance charge of \$45—making the effective interest rate 391 percent. Only about five percent of U.S. households utilize payday loans. The average borrower takes out about nine loans in a year (Hecht 2013). This intersection of effective triple-digit interest rates and frequency of utilization of payday loans has generated a provocative and expanding discourse regarding the impacts of payday borrowing on consumer welfare.

Use of payday loans is frequently associated with repeated refinancings (so-called “rollovers”), either at or within a few days following the maturity of the initial loan. According to the industry’s principal federal regulator, the Consumer Financial Protection Bureau (CFPB), a majority—55 percent—of payday borrowers roll over their loans only once or not at all; however, of the remaining borrowers, a substantial number are in debt for protracted periods; that protraction is exacerbated if gaps between loans are disregarded (CFPB 2014).

It is an article of faith among anti-payday advocates that sustained use is harmful to consumers. However, to date, the discourse on sustained use has been premised nearly exclusively on a presumption of harm, due to the absence of an empirical basis for that presumption or of any non-anecdotal evidence of actual detriment. For example, the CFPB produced a “White Paper” addressing in material part the subject of sustained use. The CFPB ultimately opined that “The potential for consumer harm and the data gathered to date are persuasive that further attention is warranted . . .” (CFPB 2013; emphasis added). More recently, however, CFPB (2014) generally avoids normative statements or unsubstantiated conclusions regarding the welfare implications of rollovers.

Such a welfare detriment is an important concept under the CFPB's governing statute, for two reasons. First, a finding of "substantial injury" is necessary in order for a financial practice to be deemed "unfair"—the principal standard by which the CFPB can regulate payday lending. To qualify as unfair, the injury must not be "outweighed by countervailing benefits to consumers or to competition."¹ Thus, unfairness-based regulation of sustained-use lending must be premised on a cost-benefit analysis that quantifies the injury to consumers, as well as the benefits.² Second, the requirement for such a cost-benefit analysis in the statute is rendered explicit: the CFPB must study "the potential benefits and costs to consumers and covered persons, including the potential reduction of access by consumers to consumer financial products or services resulting from [a payday-rollover-limiting] rule."³ To date, no academic research (or disclosed research by the CFPB itself) supplies this analysis.

In this study, I seek to contribute to closing this research gap.

As detailed below, important previous empirical studies have focused broadly on: (a) whether payday loans are generally beneficial or harmful to consumers; (b) identifying usage patterns of loans, including rollovers; and (c) ascertaining consumers' understanding of, satisfaction with and cognitive biases with respect to payday loans.

This study builds on previous work, principally of Kaufman (2013) (who studies patterns of loan usage under different state regulatory schemes), Bhutta (2013) and Bhutta, Skiba and To-

¹Dodd-Frank Wall Street Reform and Consumer Protection Act § 1031(a), 12 U.S.C. § 5531(a).

²The CFPB may also regulate payday-lending practices that it finds to be "abusive." Dodd-Frank Act § 1031(d), 12 U.S.C. § 5531(d). This standard focuses primarily on consumer understanding, behavioral and disclosure concepts that are beyond the scope of this paper.

³Dodd-Frank Act § 1022(b)(2), 12 U.S.C. § 5512(b)(2).

bacman (2012) (who study outcomes from payday-loan usage using credit scores as a welfare proxy).

I examine the welfare effects of longer “sequence” lengths of sustained borrowing.⁴ In addition, by exploiting interstate differences in rollover regulation, I examine the welfare effects of state-law limitations on rollovers.

These effects are measured primarily using credit scores as an outcome variable, a technique introduced by Bhutta (2013). Credit scores have limitations with low-income populations, and these limitations are addressed in this study. Nevertheless, for reasons discussed below, credit scores are an extremely useful proxy for overall consumer financial health.

I find that longer-term borrowers have better outcomes (measured by changes in credit scores) than consumers whose borrowing is limited to shorter durations. I also find that, although state regulation has a small effect on longer-term usage patterns, payday borrowers in less-restrictive states (i.e., those which permit many or unlimited rollovers) generally have better outcomes than those in more restrictive states, in each case controlling for the borrowers’ initial financial condition.

Specifically, using a combination of a general estimating equation model and distributional analysis, I find that sustained use of payday loans has a net positive impact on consumer credit scores, and that state-law restrictions on the duration of payday-loan borrowing have a net negative impact. These results add to a growing body of research which has found that restricting

⁴CFPB (2014) introduces the term “loan sequence,” which it defines as “a series of loans taken out within 14 days of repayment of a prior loan.” Prior work by Fusaro and Cirillo (2011) and Mann (2013) employs similar concepts. For purposes of this paper, I consider loans to be part of a “sequence” if re-borrowing occurs within two days of repayment of a prior loan. As discussed below, changes in this definition do not materially affect the principal conclusions of this paper, and the findings of this study are robust to the same definition used in CFPB (2014) and Mann (2013) (re-borrowing occurs within 14 days of repayment of the prior loan).

access to payday credit, whether generally or at refinancing, has negative consumer-welfare consequences.

These findings run counter to established notions of presumed harm from sustained use, and they therefore raise significant policy questions for the CFPB and state regulators. These findings suggest the appropriateness of further study of actual consumer outcomes before the imposition of incremental regulation at the federal or state level.

The rest of this paper proceeds as follows: Section 2 surveys current literature on payday lending, with emphasis on rollovers; Section 3 provides an overview of the data used in the study; Section 4 presents analytical results and implications; and Section 5 concludes.

2 Payday Lending Literature

Previous studies of the welfare impacts of payday lending in general are characterized by (a) ambiguity, and (b) small effects. Because controlled trials of payday-loan use have proven difficult to conduct, these studies are observational and use a variety of proxies for welfare outcomes (e.g., bankruptcies, crime, mortgage foreclosures, bank account closures, NSF checks, self-reported financial security, complaints against lenders and credit scores).

As an example of the ambiguities in these studies, Morgan and Strain (2008) find that access to payday loans results in decreases in chapter 7 bankruptcy filings. Skiba and Tobacman (2011) find that access to payday loans increases chapter 13 filings but has no effect on chapter 7 filings and no effect overall on all forms of bankruptcy combined. Maloney and Stoianovici (2008) find no relationship between access to payday loans and any kind of bankruptcy filings.

Bhutta (2013) found evidence that access to payday loans reduces the incidence of accounts in collection. Zinman (2012) found, in the wake of a rate ceiling that effectively banned

payday loans in Oregon, surveyed respondents in that state were more likely to report deterioration in self-assessed welfare than respondents in a neighboring control state.

Desai and Elliehausen (2013) found that, following payday loan bans, consumers experienced an increase in delinquencies of other credit products.

Bhutta, Skiba and Tobacman (2013) also used a welfare proxy similar to that employed in this study: Equifax consumer credit scores. They found scores were effectively the same for applicants approved and those barely rejected for payday loans. Specifically, they found that payday loan access appears irrelevant to credit improvement or deterioration.

Useful discussions of the ambiguities and remaining gaps in understanding these effects can be found in Shapiro (2011) and Caskey (2010) (“... despite the research efforts of a talented group of economists, we still don’t know the answer to the big question: [d]o payday lenders, on net, exacerbate or relieve customers’ financial difficulties?”). The details of the manifold approaches surveyed by these scholars will not be reiterated here.

To a large extent, in the absence of an answer to Caskey’s “big question,” public discourse on payday lending has moved on to the more discrete question of whether and how to regulate sustained use. Implicit in this narrowing of focus are assumptions that the CFPB cannot regulate the price of credit⁵ and that low- and middle-income consumers should not have their access to short-term credit entirely cut off. However, the CFPB has made clear that sustained use is a source of “potential” harm for which regulatory interventions should be considered. As noted previously, this theory of harm is not evidence-based.

Opponents of payday lending hypothesize that payday loans lead to a cycle of repeat borrowing. See, e.g., Center for Responsible Lending (2009). Their assumption is that repeat bor-

⁵Dodd-Frank Act § 1027(o), 12 U.S.C. § 5517(o).

rowing is unintended by the borrower and the result of the very high interest rates on the loan.

This is essentially a mathematical or mechanical theory: when a constrained borrower's limited funds are devoted to payment of relatively large amounts of interest, few resources will remain to reduce principal, and the borrower will be forced to roll over his loan. Thus, they argue, the borrower is "trapped" in a "cycle of debt."⁶

Alternatively, opponents argue that borrowers suffer from a cognitive bias—undue optimism—that causes them to overestimate their ability to repay their loans promptly. Bar-Gill and Warren (2008). Under this theory, borrowers chronically underestimate or ignore multiple demands on their incoming cash flows and fall short at payday, necessitating re-borrowing. This is a pure behavioral theory.

Fusaro and Cirillo (2011) challenged the mathematical theory. They designed a controlled field experiment to test the notion that payday borrowers are forced to devote so much of their free cash flow to interest that they are unable to repay principal—i.e., that high interest rates result in repeat borrowing. They found that when borrowers were provided with interest-free loans, there was no significant effect on rollover behavior.

Mann (2013) challenged the behavioral theory in another experiment. He surveyed borrowers at the inception of their loan "sequence" and asked them to predict their actual repayment performance. Mann found that most payday loan borrowers had never expected to be debt-free at the end of the first loan term; to the contrary, they had expected *ex ante* to roll over their loans for additional terms after the original maturity date. Specifically, borrowers predicted that they would be debt-free in a median of 36 days. In addition, 60 percent of borrowers were able to pre-

⁶It is noteworthy that the terms "cycle of debt" and "trap" are rarely used with reference to consumers who incur credit-card debt and then pay the minimum monthly payment over the longest available period, or to borrowers who take out interest-only mortgages. Critics appear to reserve the use of these terms for payday lending discourse.

dict their debt-free date to within 14 days (Mann 2013). These findings directly contradict the criticism that extended use of payday loans is the product of lender misrepresentation or borrower self-deception about when the loan will be repaid.

Kaufman (2013) found that interstate regulatory variation permitted him to challenge the view that payday lending was a “monolithic entity”; he found that, in practice, payday lending was an assortment of products which have been shaped by varying state laws. These variations have created widely differing experiences for consumers. Kaufman reports on actual usage patterns in light of state laws designed to limit repeat borrowing or excessive or hidden charges to borrowers.

Goldin and Homonoff (2013) find that, while payday lending activity decreases following stricter regulation, the reduction is offset by an increase in borrowing from arguably inferior substitute credit sources. They also document that payday-loan bans are associated with an increase in involuntary closures of consumer checking accounts—a pattern which suggests that consumers may substitute payday borrowing instruments with other forms of high-interest credit, such as bank overdrafts and bounced checks.

3 Data

Three large payday lenders provided electronic borrower histories for a total of 37,655 randomly selected individual borrowers who incurred “new” payday loans from storefront outlets located in California, Florida, Kansas, Missouri, Oklahoma, Texas and Utah (“new” means that the borrower did not have a loan with the same lender in the 90 days prior to the first loan in the dataset). Each of the lenders had been requested to provide borrower histories for 2,000 borrowers per state for each of two cohorts. The first cohort consists of borrowers who took out their initial loans in the first six months of 2006; the second cohort consists of borrow-

ers who took out their initial loans in the first six months of 2008. I use first-time borrowers from these lenders (instead of all borrowers in lender's database) to insure that repeat borrowers are not oversampled. However, this restriction results in some smaller state/cohort sample sizes than were originally requested, as lenders occasionally fell short of the 2,000 new-borrower goal in some states for one or both time periods. Additionally, two of the lenders did not have a presence in every state, or had purged the records for some states under their record-retention policies then in effect. For each borrower, the original lender data include borrower name, date of birth, social security number, borrower gross income, loan origination date, loan maturity date, principal amount, fee, a late payment indicator and a loan default indicator. These data were merged by social security number and name with credit scores and other financial-status variables from Trans Union LLC, a global leader in information management with historical credit data for nearly every credit-active consumer in the United States. Trans Union successfully matched 79.4% of the borrowers in the lenders' administrative data to the Trans Union dataset. The final merged dataset consists of 29,808 unique borrowers;⁷ in the merged dataset, all personally identifying information was deleted and replaced with unique borrower identifiers.

The lenders who submitted data for use in the study are all members of Community Financial Services Association of America (CFSA), a trade association of storefront lenders. CFSA members subscribe to a self-regulatory set of "Best Practices," which include certain voluntarily assumed limitations on rollovers and which require certain troubled debtors upon request to be offered extended repayment options at low or no cost.⁸ Compliance with these practices likely

⁷The total number of borrowers analyzed in the study varies between 29,808 and 15,021 depending upon the analysis year and the variables in question.

⁸See <http://cfsaa.com/cfsa-member-best-practices.aspx>.

results in observed consumer rollover behavior and creditworthiness in this study differing somewhat from that of the general marketplace.

The data fields appended by Trans Union included hundreds of credit attributes commonly found in a consumer credit file (e.g., number of trade lines, highest balance on revolving trades, highest ever collection balance, etc.). These credit attributes also included individual credit scores. These scores were used as the principal outcome variable in this study because they are a general proxy for overall financial health.

The credit score used here is the VantageScore[®]. This is a proprietary score developed by the three major credit bureaus (Trans Union, Equifax and Experian) to identify loan applicants likely to become 90 or more days delinquent within a 24-month period. The VantageScore ranges from a low of 501 to a high of 990. The score is an index of an individual's overall financial health and is based on multiple general factors regarding a consumer's credit-related behavior, including delinquencies, line utilization, balances, depth of credit, recent credit and available credit. Because delinquencies and payment history contribute to about 35% of one's credit score, the score becomes a proxy for an individual's ability to manage payments and avoid delinquencies. Consequently, if a borrower is experiencing difficulty meeting financial obligations, the credit score would be expected to reflect this difficulty. Thus, credit scores are a valuable tool for measuring, and generally an accurate reflection of, overall financial health. Such scores are particularly valuable in the context of this study because payday loans are generally not reported to the large national credit reporting agencies; thus the outcome variable is independent of the treatment variable. Because payday-loan activity is not factored in the calculation of the credit score, any correlation between payday-loan activity and credit-score dynamics lacks a direct causal relationship. One advantage of specifically using the VantageScore over the mainstream

FICO® score is that the VantageScore may provide more accurate reflections of consumers with subprime, new or “thin” credit histories. For example, where a FICO score requires at least six months of history, the VantageScore is calculated with as little as one month of history. In addition, the VantageScore minimizes the scoring impact of loans less than \$250.^{9,10}

Nevertheless, credit scores have certain limitations in this context. While credit scores may be useful as a broad measure to discriminate between classes of borrowers (e.g., “subprime” and “superprime”), the value of such scores as a proxy for overall financial health may be attenuated if the changes in scores are small. Only substantial changes in credit score are likely to have a material impact on any given individual’s welfare.

Where recent research on payday lending activity has included analysis of the impact of regulatory differences on payday loan usage (e.g., Kaufman, 2013) or on consumer credit attributes (e.g., Desai and Elliehausen, 2013), the current study integrates payday borrowing activity with credit attributes and scores for the same borrowers—allowing for a unique contribution to the growing body of research regarding impacts of regulation and sustained usage of payday lending on consumer financial welfare, the proxy for which in this study is changes in VantageScore.

4 Results

This study seeks to join this growing body of data-driven research addressing hypotheses that payday borrowing negatively impacts borrower welfare. This study operationalizes “welfare” as change in the borrower’s VantageScore following payday borrowing. I focus on changes in scores as a principal outcome; I study how such changes are impacted by differences in rollo-

⁹See <http://www.vantagescore.com/scores-more-people>.

¹⁰See <http://www.credit.com/2013/01/fico-v-vantagescore-5-differences-you-should-know>.

ver behavior, irrespective of regulatory environment, and how such changes are impacted by state rollover regulation, in each case over two different time periods.

Table 1 provides a listing of the summary of regulations in the seven states included in the current analysis. It is important to note that these states are substantively different in their approach to regulation and that they represent different regional areas. No two have identical regulatory schemes. All but Texas have some form of implicit or explicit restriction on rollovers.¹¹ During the study period (2006-2009), Texas permitted operators to offer payday loans statewide under a “credit services organization” (CSO) model, and therefore not subject to the state’s other small-loan laws and regulations. The loans to Texas residents in this study were made pursuant to the CSO model.¹² Given the continuum of rollover regulations by state, a binary indicator of “restrictive” or “non-restrictive” for each state was not feasible and would not have been meaningful. Therefore, the interstate analysis in the current study compares results from Texas, a largely unregulated control environment, with the other states across the regulation continuum, as the treatment environments, in an attempt to evaluate the impacts of differences in regulation.

Table 2 provides the descriptive statistics for the borrowers by state. The average income of the sample of borrowers ranges from \$21,848 in Missouri to \$26,059 in California, with an overall average of \$24,585. The mean number of annual payday loans ranges from 5.2 per year in Utah to 8.6 per year in Kansas, with an overall average of 7.4—slightly below the average of 9

¹¹Utah limits the aggregate term of borrowing to ten weeks. Assuming a loan term of two weeks, this is the equivalent of one original loan plus four rollovers. While California prohibits “rollovers,” it allows same-day transactions which may have some economic equivalence to rollovers. Missouri has a limitation of a loan renewal up to six times, with a 5% reduction in principal with each rollover. The remaining states (except Texas) have various explicit bans on rollovers. Two states in the sample—Florida and Oklahoma—enforce their rollover restrictions by requiring lenders to report to and query a statewide borrower database.

¹²See <http://www.sos.state.tx.us/statdoc/faqs2800>.

loans per year reported by Hecht (2013), but closely aligned with an average of 6.8 reported by Fusaro and Cirillo (2011). The average credit score is 587, ranging from a low of 578 in Texas to a high of 595 in California. These values are higher than the average credit score of 513 found in Bhutta et al. (2013); Bhutta used a conceptually similar, but differently scaled, Equifax score; and it is unclear to what extent, if any, Bhutta's subjects borrowed from CFSA member lenders who may subscribe to the self-regulatory practices described above.

Table 3 provides payday borrowing activity by state, including average rollovers per borrower. An immediate observation is that states in Table 1 with strict rollover restrictions (e.g., Florida, Kansas and Oklahoma) actually have a substantial count of payday loans deemed to be rolled over.

This observation raises two issues. The first is related to the definition of a "rollover." "Rollover" is a term with no fixed or uniform definition. Recognizing this lack of a common definition, Fusaro and Cirillo (2011) "somewhat arbitrarily" defined a "spell" to include all new loan transactions undertaken within 30 days of maturity of the previous loan. Mann (2013) defined an economic "rollover" as loans with 14 days between maturity date and next origination. CFPB (2014) introduces the concept of "sequences"; similar to Mann's approach, a loan is considered a continuation of previous credit when it is undertaken within 14 days of the prior loan's due date.

In the current study, I have elected to use a definition of rollover that comports with more traditional notions of "nearly same-day" refinancing. For the data used in this study, it is difficult to distinguish "same day" loans (a new loan taken out on the same day) from a loan rolled over (a continuation of an existing loan). Lenders record rollovers as two separate loans, instead of one loan with a continuation. In addition, while some states proscribe same-day refinancings

(e.g., Florida, which has a one-day “cooling-off” period between successive loans), consumers frequently appear to arrange their affairs to consummate the new loan one day later. Therefore, in the present study, an economic “rollover” exists when there were fewer than two days between the date an existing loan was paid and the origination date of a new loan to the same borrower with the same lender. In other words, I deem a rollover to exist if the borrower was debt-free for less than two days between loans.

I posit that this “tight” definition of a rollover will isolate the “purest” group of serial users; an individual who rolls over a loan within 48 hours of the maturity date would likely consider the debt to be a continuation of the same loan. While this approach may capture fewer overall transactions, it will more precisely capture and characterize the activity of those borrowers who did not retire their debt on the designated maturity date—either by choice (Mann [2013] determined that most borrowers who roll over a loan fall into this category) or by circumstance, including those borrowers experiencing an unexpected financial shock (e.g., a natural disaster or medical emergency) in a way that a longer-period definition may not. In addition, individuals residing in states with restrictions on rollovers (see Table 1) are those borrowers who must contribute additional effort to arrange their affairs to consummate the new loan, providing at least anecdotal evidence of organized intent to continue the loan after maturity. I find that 55% of borrowers who rolled over a loan within 14 days did so within two days; and 95% did so within seven days. Therefore, a tightened definition of rollover at two days still encompasses over half of all borrowers rolling over their loans. As will be presented below, the results of this study are robust to different definitions of “rollover.”¹³

¹³One effect of this tighter definition is that the reported number of loans rolled over in Table 3, for example, is lower than would be reported under a longer period, although the relative distribution among states is approximately the same. A secondary analysis of the main mod-

The second issue is related to the existence central databases. Two of the states in the present study—Florida and Oklahoma—require payday lenders to report payday loans to a central database. The result is that information about outstanding indebtedness is common, rather than lender-specific. Proponents of databases contend that without a database, a borrower could borrow from multiple lenders simultaneously. In Table 3 it is shown that Florida and Oklahoma, the states in this study with required databases, have slightly lower average counts of loans “rolled over” (less than two days between loans) per borrower relative to the other states included in the study. However, these values are still quite high—2.5 and 2.6 rollovers per borrower, respectively, considering the relatively tight rollover restrictions combined with the presence of central databases. Utah, for example, has a rollover rate of 2.9 per borrower, just slightly in excess of the rates for Florida and for Oklahoma; Utah has relatively non-binding rollover restrictions and no central database.

Table 4 provides statistics for the number of payday loans utilized until borrowers are debt-free for 14 or more days (similar to the definition used by Mann, 2013 and CFPB, 2014). The overall mean number of payday loans required before debt-free status is 4.6, with a median of 2. Florida, which most heavily restricts payday loan access, has a mean of 4.5 loans—slightly under the national average. Although Texas, with few restrictions on payday lending, has an average of 5.4, Utah, which has relatively fewer restrictions on rollovers, is lower than Florida, with an average of 3.4 payday loans required until the borrower is debt-free. I thus find, consistently with Kaufman (2013), that differences in interstate rollover regulation appear to have only a small effect on longer-term usage patterns.

eling results is provided in Appendix B and also demonstrates no substantive differences in outcomes.

Table 5 shows that the overall average credit score decreased for these payday borrowers from an average of 588 in 2006 to 579 in 2009. These results are typical of consumers in the subprime segment (FICO 2013). However, these overall averages by year mask important distributional variations.

In an effort to capture and explain the variation in changes in credit scores, changes were categorized into ten deciles ranging from a decrease in credit score of more than 20 percent to an increase of greater than 0 percent. Through examining percentage change as an outcome variable, the approach controls for differences in starting score.

To that end, Table 6 demonstrates two important points. First, the majority of payday borrowers in the study typically experienced relatively small decreases, or even increases, in their credit scores. This is evidenced by the relatively large percentage of borrowers in the -2.5 percent to 0 percent and > 0 percent change segments. Overall, 43 percent of borrowers in 2006-2007 and 54 percent of borrowers in 2008-2009 actually experienced an increase in their credit scores after taking out a payday loan (as noted previously, all consumers in the dataset are “new” payday borrowers).

The second point is that borrowers experienced smaller decreases in credit scores during the second time period (2008-2009) than they experienced in the first time period (2006-2007). This is relevant given that the amount of total revolving consumer credit available across the whole of the economy as reported by the Federal Reserve increased by 7 percent from 2006-2007, but decreased by the same amount from 2008-2009.¹⁴ While mainstream consumer credit is frequently asserted to have “dried up” beginning in 2008-2009, payday loan borrowers, as a

¹⁴See http://www.federalreserve.gov/releases/g19/HIST/cc_hist_sa_levels.html.

whole, continued to have access to payday loans, possibly preventing a further decrease in their overall welfare. This point will be developed in greater detail below.

Across the same segments of changes in credit score introduced in Tables 6, there is also variation in payday borrowing behavior. In the entire range of the 2006-2009 period, the mean number of rollovers per customer per year demonstrated a general upward, albeit somewhat inconsistent, trend—where customers experiencing the worst decreases in their credit scores had about 2.9 total rollovers per year on average, increasing to just over 3.3 rollovers per customer per year for the customers in the best-performing change segment (those with a positive change in credit score), again supporting the conclusion that as customers have greater access to rollovers, they were less likely to have a decrease in their credit scores. See Figure 1.

While this examination provided initial insights regarding the welfare of payday borrowers, I wanted to assess the relative impacts of traditional credit attributes on changes in consumer credit score compared to the impacts of payday loan rollover activity and regulatory environment, with specific attention to the relative impacts of the different regulatory environments. To accomplish this, I developed a general estimating equation. The equation incorporated well-accepted contributors to credit score, which were selected roughly to mirror those utilized by Bhutta et al. (2013) and were found to be particularly predictive of credit score, including bankruptcies, balances on revolving bank cards, line utilizations, inquiries, derogatory lines and charge-offs (see Appendix A for a full explanation of the predictors). I incorporated payday lending regulatory environment as a predictor of change in credit score—operationalized as “state.” Given its limited regulatory environment, Texas was established as a “control” state. The effects of all other states on changes in credit score were therefore measured relative to Texas.

The general form of the equation is:

$$g(\mu_i) = \beta_s * \text{state} + \beta_j * X_{ij}^T \quad (1)$$

where the dependent variable μ_i measures the change in a borrower's credit score from either 2006 to 2007 or from 2008 to 2009 for each borrower i . β_s represents a vector of coefficients for the impact of each individual state on the change in credit score relative to Texas (the control state). β_j represents a vector of coefficients for the individual impacts of each individual predictor variable X_{ij} . Finally, T represents the beginning or the end of the time period measured.

The results of the model for 2006-2007 in Table 7, and then for 2008-2009 in Table 8, provide support the conclusion that borrowers experience a net positive welfare impact when they face fewer restrictions on rollovers. From Table 7, the overall predictive accuracy of the model was found to be .65. Any estimate with a negative value indicates that the factor contributed to a decrease in borrowers' credit scores between 2006 and 2007. I found that the average number of total rollovers per borrower is positively related to change in credit score and is more predictive of change in credit score than are traditional credit attributes such as the number of bankruptcies or revolving bankcard balances.

Because Texas was used as a control state, any state with a negative estimate indicates that the state regulatory environment contributed to a decrease in credit scores relative to Texas. Only Oklahoma was not significantly different from Texas. It is worth noting that, during this time period, only borrowers in Florida, which is the state with the most rollover-restrictive regulatory environment, experienced an increase in credit scores relative to borrowers in Texas (although this outcome is reversed in the next time period, as demonstrated in Table 8). It is also

worth noting that, with the exception of Oklahoma, “state” was a stronger predictor of credit score increase or decrease than an individual’s bankruptcies or revolving bankcard balances.¹⁵

Table 8 provides the model information for the same factors contributing to a change in credit score from 2008 to 2009. As referenced above, the climate for consumer credit was substantively different than for the period previous and was characterized by a more restrictive credit market. This difference is manifested in several ways. For example, from Table 9, balances 90+ days delinquent on auto loans in 2006 for all states included in the study were between 2 and 3 percent of all such accounts, with Texas being the only state above 3 percent. While this percentage increased slightly to 3-4 percent for all states in 2007 (except Kansas, which remained below 3 percent), this same measurement increased to over 6 percent in California and to over 7 percent in Florida. A similar pattern was present with revolving credit card balances. In 2006, Texas had the highest percent of balances 90+ days delinquent at 13.8 percent. For all states included in the study, this percentage changed little by 2007. However, by 2009, delinquent revolving credit card balances in California had increased to 17.2 percent and the percentage in Florida had increased to 19.4 percent, from a 2006 value of 8.9 percent and 11.2 percent, respectively¹⁶. Noting these patterns in the underlying economies, it is not surprising that some of the results for this period are quite different from those detected in the previous period. The overall predictive accuracy of this model was substantively stronger than the previous model, with a pseudo R^2 of .78. Again, total average rollovers per borrower continued to have a positive impact on change in credit score during this period, and that this impact was more important than bankruptcies, balances on revolving bankcards and number of inquiries within last six months. Notably, during

¹⁵Relativity of impact can be ascertained through the evaluation of the standardized z-scores—not the beta estimates.

¹⁶Federal Reserve Board of New York/Equifax.

this time period, the impact of a borrower living in Florida resulted in a decrease in credit scores (again relative to the control state of Texas) where the effect of borrowing in Florida had previously contributed to a net improvement in credit scores from 2006-2007.¹⁷

This finding provides directional evidence that tight restrictions on rollovers appear to harm borrowers in states like Florida during years when liquidity in mainstream credit markets is limited, but borrowers in less restrictive states like Texas, which actually had higher starting delinquencies in 2006, are better able to “weather” large variations in credit access through the use of payday loans. It is possible that had borrowers in Florida had less restrictive access to payday loans, their delinquency increases may have been less extreme in 2008 and 2009.

Given the findings from the models that regulatory environment, operationalized as state, appears to be a significant contributor to change in credit score for payday borrowers, I chose to isolate this predictor, to examine further the distribution of credit score changes within these states, using the logic developed in Table 6. Specifically, if state regulatory environment plays no role in a borrower’s change in credit scores, and has somehow been inflated in the context of a multivariate model presented in Tables 7 and 8, then it would be expected that each state would have approximately the same distribution within each decile of change in credit score, ceteris paribus.

For example, from Table 10, California represents 14.7 percent of the total customers in the dataset from 2006-2007. It would, therefore, be expected that California would comprise approximately this percentage in all of the ten segments of change in credit scores. However, California, a state which at least nominally limits payday rollovers, is substantively over-represented

¹⁷There were a total of 15,021 borrowers for whom there were no missing observations and who could be evaluated in a GEE for the 2006 to 2009 period. While the coefficients varied slightly from the two individual period models reported, neither the relative nor the absolute significance changed.

in the worst-performing segments (e.g., < 20 percent decrease, 20 percent to 17.5 percent decrease), while Texas, the “control” state, is substantively under-represented in the same segments (again, recall from Table 9 that Texas borrowers started 2006 with a higher proportion of debt 90+ days delinquent). Specifically, California is over-indexed in the worst performing segment at a rate of 1.3, while Texas is under-indexed at 0.8.^{18,19}

In 2008 to 2009, Florida is the most over-represented state in the worst performing segment—with 20.2 percent of the borrowers in this segment but only 14.4 percent of the file (i.e., over-indexed at 1.4). As in 2006-2007, Texas is substantively under-represented in the worst-performing segment (under-indexed at 0.6).²⁰ See Table 11.

5 Conclusions

Critics of payday lending contend that sustained use adversely affects borrower welfare. This criticism has led to a series of state-level regulatory responses restricting such longer-term use of payday loans. Again, these interventions are premised on the presumed, but undemonstrated, harm arising from sustained use.

This study contributes to a growing body of literature which shows that payday loans may not only fail to contribute negatively to borrower welfare, but may actually contribute to an improvement in borrower welfare, measured here as an increase in overall credit scores.

Specifically, the results of this study make two important contributions:

¹⁸Index = actual percentage/expected percentage.

¹⁹This result is highly significant, X^2 (54, $n=28,444$, $p < 0.0001$), but overpowered, given the number of observations.

²⁰This result is highly significant, X^2 (54, $n=29,572$, $p < 0.0001$), but overpowered, given the number of observations.

The first contribution is related to sustained use of payday loans. Within the general estimating equations, the total number of payday loan rollovers was found to be strongly positively related to changes in credit score. In addition, the total number of rollovers was higher for borrowers who experienced increases in their credit score and lower for borrowers who experienced decreases in their credit scores. These results provide evidence for the proposition that borrowers who face fewer restrictions on sustained use have better financial welfare outcomes, defined as increases in credit scores. Importantly, not only did sustained usage not contribute to a negative outcome, it contributed to a positive outcome for borrowers. Because credit scores are heavily comprised of payment history and delinquencies, if a borrower were experiencing difficulty making payments, we would expect to see a decrease in credit scores (or at least no change in credit scores) for heavy payday loan borrowers. However, the opposite effect was found. In a larger sense, these findings are consistent with those of Zinman (2010), Goldin and Homonoff (2013) and Desai and Elliehausen (2014): consumers' inability to access payday credit, whether generally or at the time of refinancing, does not end their need for credit; thus denying them access to original, or refinance, payday credit may have welfare-reducing consequences.

These findings are also mathematically consistent with prior findings by others to the effect that access to payday loan is welfare-enhancing (or not welfare-reducing). Assuming that payday loans produce a net mean improvement (or no decline) in welfare for all borrowers, and assuming further (as CFPB [2013] teaches) that most loans are rollovers, then it makes sense that rollovers should have favorable (or non-negative) welfare consequences for borrowers.

The second contribution is related to regulatory context. Overall, a majority of payday borrowers experienced an increase in their credit scores over the time period studied. However, the borrowers who experienced the largest declines in credit scores were most likely to live in

states with greater nominal restrictions on payday rollovers: California and, during the 2008-2009 liquidity crisis, Florida. The converse was also true. Borrowers who experienced the largest decreases in credit scores were least likely to live in the state with the fewest restrictions on rollovers: Texas.

There are other exogenous economic factors which could impact changes in credit scores. For example, interest rates and some other loan terms vary among the states selected, although these differences are unlikely to be of much moment. Moreover, there are interstate differences in consumer financial status that arise from local economic conditions unobserved in this study. However, the results related to regulatory context cannot simply be dismissed as a function of unexamined economic factors. This is true for two reasons. First, regulation in the most restrictive states was enacted specifically create the opposite effect—to improve consumers’ welfare by limiting rollovers. The evidence was precisely to the contrary: state of borrowing was found to be a stronger predictor of changes in credit scores than were bankruptcy or revolving balances on bank cards. The second reason is that Texas, the state examined in this study with the least restrictive regulatory environment for payday borrowing and the highest rate of rollover activity, actually had the highest percent of balances 90+ days delinquent in 2006—the beginning period for this study—and yet borrowers in this state experienced smallest least decreases in credit scores over the four-year period studied.

This study has important policy implications for the CFPB and state regulators. While previous research has largely focused on mean outcomes from payday loan usage, this is the first to look at the distribution of outcomes at the individual level and to attempt to relate that distribution to variations in sustained-use patterns. Despite several years of finger-pointing by interest groups, it is fairly clear that, whatever the “culprit” is in producing adverse outcomes for payday

borrowers, it is almost certainly something other than rollovers—and apparently some as yet unstudied alternative factor. Additional investigation is necessary to tease out the causes of this distribution.

Premature new proscriptions on rollovers may not only deprive borrowers of a useful and welfare-enhancing source of continued credit when needed, but it may also mask the true causes of detriment to those borrowers who do not benefit from payday credit.

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Tables

Table 1. *Summary of Payday Lending by State*

State	Rollover Restriction	Waiting Period	Database	Fee cap per \$100 borrowed
California*	YES	NO	NO	\$17.65
Florida	YES	YES	YES	\$16.11
Kansas	YES	NO	NO	\$15.00
Missouri	NO#	YES	NO	\$75.00+
Oklahoma	YES	NO	YES	\$15.00
Texas	NO	NO	NO	NO CAP
Utah	NO#	NO	NO	NO CAP

*Prohibits rollovers but allows same-day refinancing transactions.

+Missouri's fee limitation applies to the original loan and all renewals, with a maximum of 6 rollovers. The fee cap of \$75 represents the maximum amount paid of the original loan across all possible renewals.

#Aggregate duration limit.

Table 2. *Summary Statistics of Borrowers by State*

	Yearly Income mean/sd	Age mean/sd	Annual Number of Loans mean/sd	Credit Score mean/sd	Bankruptcy mean/sd	Num. Collections mean/sd	Collections Balance mean/sd
CA	26059.14 (25229.09)	38.22 (13.16)	7.59 (5.63)	595.40 (66.07)	0.02 (0.13)	3.62 (4.42)	474.58 (1751.97)
FL	23159.62 (16287.72)	41.16 (13.06)	5.90 (4.34)	594.22 (58.41)	0.02 (0.13)	5.34 (6.00)	833.62 (3187.94)
KS	22858.44 (19436.16)	38.34 (12.10)	8.61 (6.10)	581.33 (61.72)	0.03 (0.17)	5.91 (6.69)	693.47 (2916.06)
MO	21848.48 (18967.79)	37.97 (12.24)	7.84 (5.71)	585.75 (59.75)	0.03 (0.17)	4.95 (5.66)	775.18 (3615.03)
OK	22021.86 (16277.54)	40.12 (13.02)	5.75 (4.41)	586.68 (56.45)	0.02 (0.14)	5.09 (6.20)	672.81 (3127.79)
TX	24886.44 (16360.03)	42.77 (12.75)	6.36 (4.63)	578.17 (54.65)	0.02 (0.14)	5.93 (6.01)	869.49 (2734.57)
UT	24773.67 (16523.79)	37.77 (12.64)	5.24 (4.41)	590.77 (59.44)	0.05 (0.21)	5.60 (6.94)	449.91 (2224.92)
Total	24585.83 (17973.39)	39.15 (12.91)	7.37 (6.43)	586.87 (54.13)	0.02 (0.15)	5.76 (6.59)	687.71 (7475.17)
<i>N</i>	29427	29402	29428	27227	29428	29428	29349

Table 3. *Payday Loan Activity by State*

	Total Number of Loans	Total Number of Loans Rolled Over (<=2 Days)	Average Count of Loans Rolled Over Per Borrower
CA	134,500	27,157	3.22
FL	112,729	20,697	2.51
KS	150,403	35,040	4.91
MO	138,672	32,844	4.91
OK	177,416	35,418	2.62
TX	92,472	35,701	3.86
UT	46,415	17,506	2.86
Total	852,607	204,363	3.42

Table 4. *Payday Loan Debt Until Debt-Free 14 Days*

	Number of Loans				Days In Debt				Amount Paid (Fees)			
	mean / sd	p25	p50	p75	mean / sd	p25	p50	p75	mean / sd	p25	p50	p75
CA	4.29 (7.96)	1	2	4	84.60 (153.67)	14	29	96	277.90 (590.32)	45	90	244
FL	4.47 (7.80)	1	2	5	70.20 (136.67)	14	28	78	196.32 (374.61)	43	76	220
KS	6.13 (9.90)	1	3	6	99.44 (176.19)	16	39	98	289.47 (566.85)	45	101	285
MO	5.62 (8.64)	1	3	6	97.57 (160.84)	17	43	101	263.00 (489.09)	45	98	251
OK	3.77 (5.32)	1	2	4	73.19 (115.54)	21	39	84	183.58 (281.45)	50	95	210
TX	5.38 (7.71)	1	3	6	103.10 (150.59)	26	58	124	533.59 (825.40)	105	255	611
UT	3.42 (3.55)	1	2	4	51.41 (55.62)	15	31	62	285.38 (371.89)	75	152	342
Total	4.63 (7.43)	1	2	5	82.48 (140.28)	16	38	92	285.07 (534.29)	50	113	293
N	29425				29425				29425			

Table 5. *Overall Credit Scores for Payday Borrowing Customers*

Year	N	Mean	Std Dev	P25	Median	P75
2006	28,444	588	57	549	587	618
2007	29,056	582	57	541	581	612
2008	29,572	583	54	544	576	612
2009	29,781	579	57	538	574	612

Table 6. *Segmentation of Customers by Changes in Credit Score*

Change in Credit Score	Distribution of File	
	2006 to 2007	2008 to 2009
<-20%	4.94%	1.94%
-20% to <-17.5%	1.36%	0.99%
-17.5% to <-15.0%	2.11%	1.82%
-15.0% to <-12.5%	3.97%	2.97%
-12.5% to <-10%	4.37%	4.56%
-10% to <-7.5%	5.64%	5.13%
-7.5% to <-5%	6.98%	6.26%
-5% to <-2.5%	9.01%	8.13%
-2.5 to < 0%	18.58%	14.03%
>=0%	43.05%	54.17%
Total	29259	29808

Table 7. *Results of General Estimating Equation for Change in Credit Score from 2006-2007**

Factor (n=15,021)	Estimate	Z Score	p-Value	Overall Pseudo R ²⁺
Intercept	582.3988	467.79	<.0001	0.65
Time	-1.5371	-3.32	0.0009	
CA	-1.8290	-1.92	0.0551	
FL	3.3102	3.37	0.0008	
KS	-2.1977	-2.30	0.0213	
MO	-1.9072	-1.97	0.0489	
OK	-0.3249	-0.39	0.6976	
UT	-2.3138	-2.21	0.0274	
TX	0.0000	.	.	
Total Rollovers	0.1591	2.74	0.0061	
Bankruptcy	-0.4789	-1.10	0.2718	
Balances on Revolving Bankcards	-0.0000	-1.69	0.0912	
Pct of Lines over 50% utilized	-0.0732	-4.66	<.0001	
Pct of Lines over 75% utilized	-0.1637	-12.71	<.0001	
Number of Inquiries	-0.5185	-12.76	<.0001	
Number of Inquiries <6 months	0.5265	5.88	<.0001	
Number of Installment Trades opened <6 months	0.8911	12.65	<.0001	
Number of Derogs over \$100	-1.1474	-23.22	<.0001	
Charge offs in the last 24 months	-0.7050	-4.32	<.0001	

*Accounts with VantageScores greater than 700 were not included in the model because they were deemed non-representative outliers. This decision excluded less than 3% of the borrowers with complete records.

+ Efron's Pseudo R² was used for this calculation:

$$R^2 = 1 - \frac{\sum_{i=1}^N (y_i - \hat{y}_i)^2}{\sum_{i=1}^N (y_i - \bar{y})^2}$$

Table 8. *Results of General Estimating Equation for Change in Credit Score from 2008-2009**

Factor (n=17,975)	Estimate	Z Score	p-Value	Overall Pseudo R ²⁺
Intercept	574.9368	530.42	<.0001	0.78
Time	1.0502	2.43	0.0150	
CA	-5.7095	-6.59	<.0001	
FL	-3.9192	-4.40	<.0001	
KS	-1.2473	-1.36	0.1734	
MO	-3.8351	-4.07	<.0001	
OK	-0.0804	-0.10	0.9195	
UT	-2.7054	-2.75	0.0060	
TX	0.0000	.	.	
Total Rollovers	0.1089	1.99	0.0461	
Bankruptcy	0.2864	0.67	0.4999	
Balances on Revolving Bankcards	-0.0000	-1.46	0.1434	
Pct of Lines over 50% utilized	-0.0068	-0.47	0.6349	
Pct of Lines over 75% utilized	-0.1937	-15.82	<.0001	
Number of Inquiries	-0.3986	-11.24	<.0001	
Number of Inquiries <6 months	0.1373	1.65	0.0997	
Number of Installment Trades opened <6 months	0.7895	12.60	<.0001	
Number of Derogs over \$100	-1.1742	-26.15	<.0001	
Charge offs in the last 24 months	-0.6401	-5.01	<.0001	

*Accounts with VantageScores greater than 700 were not included in the model because they were deemed non-representative outliers. This decision excluded less than 3% of the borrowers with complete records.

+Efron's Pseudo R² was used for this calculation:

$$R^2 = 1 - \frac{\sum_{i=1}^N (y_i - \hat{y}_i)^2}{\sum_{i=1}^N (y_i - \bar{y})^2}$$

Table 9. *Consumer Debt Activity by State**
Percent of Loan Balances 90+ Days Delinquent

	<i>Auto Loans</i>				<i>Revolving Credit Cards</i>			
	2006	2007	2008	2009	2006	2007	2008	2009
CA	2.62	3.60	4.98	6.18	8.98	9.32	11.57	17.19
FL	2.64	3.57	5.39	7.13	11.20	10.85	13.76	19.38
KS	2.21	2.43	2.66	3.40	8.49	7.97	7.75	8.88
MO	2.68	3.08	3.79	4.50	9.89	9.35	9.33	11.44
OK	2.84	3.31	3.73	4.30	10.50	10.22	9.93	11.28
TX	3.09	3.38	4.03	5.43	13.81	12.98	11.92	13.67

*Auto Loans and Revolving Balances on Credit Cards were selected over mortgages or HELOCS with the intention of using loan types which were more common to the subprime and alternatively banked segments.

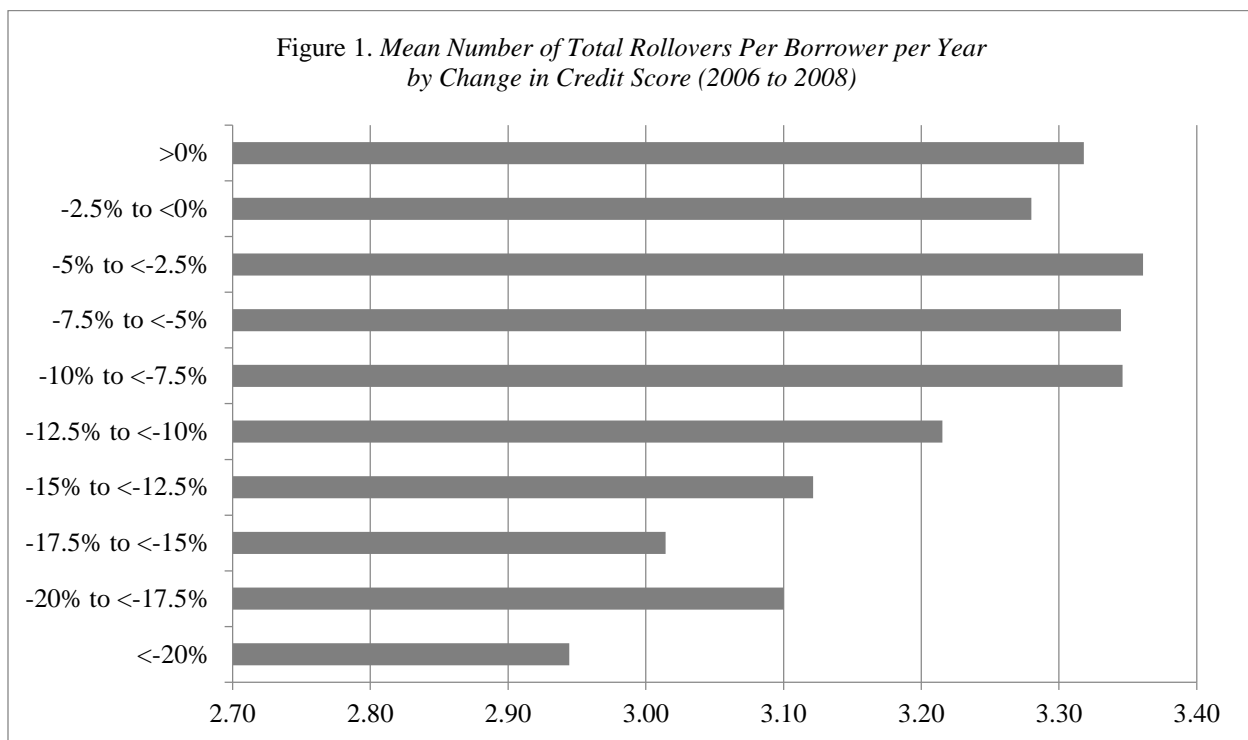
Table 10. *Segmentation of Customers by Changes in Credit Score by State for 2006 to 2007*

Change in Credit Score	CA	FL	KS	MO	OK	TX	UT
<-20%	18.54%	14.10%	10.30%	11.89%	21.39%	11.57%	12.20%
-20% to <-17.5%	18.14%	17.63%	8.31%	12.34%	19.65%	11.59%	12.34%
-17.5% to <-15.0%	14.91%	12.48%	11.51%	10.70%	24.64%	14.91%	10.86%
...							
>=0%	14.60%	13.88%	11.56%	10.67%	22.85%	16.22%	10.22%
Overall Percent of File	14.74%	14.26%	11.45%	11.16%	22.56%	15.44%	10.38%
Average Borrower Credit Score							
2006	592	598	583	587	587	578	590

Table 11. *Segmentation of Customers by Changes in Credit Score by State for 2008 to 2009*

Change in Credit Score	CA	FL	KS	MO	OK	TX	UT
<-20%	17.30%	20.23%	8.21%	11.44%	19.94%	9.38%	13.49%
-20% to <-17.5%	18.58%	15.54%	8.11%	11.49%	19.59%	14.86%	11.82%
-17.5% to <-15.0%	17.90%	17.71%	8.67%	10.89%	18.27%	12.92%	13.65%
...							
>=0%	14.76%	14.42%	11.83%	11.23%	23.04%	14.89%	9.82%
Overall Percent of File	14.94%	14.39%	11.40%	11.10%	22.28%	15.35%	10.55%
Average Borrower Credit Score							
2008	572	576	573	577	578	568	578

Figure



Appendix A

Definitions of Credit Attributes Used in The General Estimating Equation

Bankruptcy: The total number of bankruptcies borrowers have declared. Values ranged from 0 to 11.

Balances on Revolving Bankcards: Average balance of all unsecured bankcard trades. Values ranged from 0 to \$450,452.

Percent of Lines over 50% utilized: Percent of all tradelines, including secured and unsecured with utilizations over 50%. Values ranged from 0 to 100%.

Percent of Lines over 75% utilized: Percent of all tradelines, including secured and unsecured with utilizations over 75%. Values ranged from 0 to 100%.

Number of Inquiries: Total number of inquiries found on a borrower's record. Values ranged from 0 to 74.

Number of Inquiries <6 Months: Total number of inquiries placed within six months prior to the date the file was pulled. Values ranged from 0 to 53.

Number of Derogs over \$100: Number of Public Records, Liens or Tradelines listed as derogatory with balances greater than \$100. Values ranged from 0 to 115.

Chargeoffs in the last 24 Months: Total number of accounts charged off of the borrower's file within 24 months of the date the file was pulled. Values ranged from 0 to 24.

Appendix B

In order to test the robustness of the restricted definition of a rollover used throughout the paper, I have computed the primary analyses under an alternate definition of a rollover. This alternate definition includes all new loan transactions undertaken within 14 days of maturity of the previous loan—as opposed to two days in the analysis above. The following tables report summary statistics, and general estimating equation results derived under this alternate definition. The results show the same patterns as those set forth in Tables 3, 6 and 7 as well as in Figure 2.

Table B1. *Payday Loan Activity by State*

Where Rollovers are defined as within 14 days between Loans

	Total Number of Loans	Average Count of Loans Rolled Over Per Borrower
CA	134,500	5.13
FL	112,729	5.24
KS	150,403	7.71
MO	138,672	7.07
OK	177,416	4.88
TX	92,472	5.51
UT	46,415	4.57
Total	852,607	5.60

Table B2. *Results of General Estimating Equation for Change in Credit Score from 2006-2007**
Where Rollovers are defined as ≤ 14 days between loans

Factor (n=15,021)	Estimate	Z Score	p-Value	Overall Pseudo R ²
Intercept	583.05	462.80	<.0001	0.65
Time	-1.63	-3.53	0.0004	
CA	-1.88	-1.96	0.0499	
FL	3.03	3.09	0.0020	
KS	-2.71	-2.81	0.0050	
MO	-2.17	-2.22	0.0264	
OK	-0.45	-0.53	0.5938	
UT	-2.43	-2.31	0.0208	
TX	0.00	.	.	
Avg Total Rollovers (14 Day)	0.18	3.65	0.0003	
Bankruptcy	-0.63	-1.44	0.1491	
Balances on Revolving Bankcards	-0.00002	-1.58	0.1133	
Pct of Lines over 50% utilized	-0.07	-4.67	<.0001	
Pct of Lines over 75% utilized	-0.17	-12.90	<.0001	
Number of Inquiries	-0.52	-12.72	<.0001	
Number of Inquiries <6 months	0.53	5.88	<.0001	
Number of Installment Trades opened <6 months	0.89	12.55	<.0001	
Number of Derogs over \$100	-1.16	-23.56	<.0001	
Charge offs in the last 24 months	-0.76	-4.64	<.0001	

*Accounts with VantageScores greater than 700 were not included in the model because they were deemed non-representative outliers.

Table B3. *Results of General Estimating Equation for Change in Credit Score from 2008-2009**
Where Rollovers are defined as ≤ 14 days between loans

Factor (n=17,975)	Estimate	Z Score	p-Value	Overall Pseudo R ²
Intercept	575.12	516.88	<.0001	0.73
Time	1.36	3.11	0.0018	
CA	-5.96	-6.74	<.0001	
FL	-3.95	-4.40	<.0001	
KS	-1.37	-1.46	0.1443	
MO	-3.83	-4.00	<.0001	
OK	-0.26	-0.32	0.7500	
UT	-2.41	-2.40	0.0166	
TX	0.00	.	.	
Total Rollovers (14 Day)	0.11	2.23	0.0259	
Bankruptcy	-0.18	-0.43	0.6659	
Balances on Revolving Bankcards	-0.00003	-2.02	0.0433	
Pct of Lines over 50% utilized	-0.0042	-0.29	0.7742	
Pct of Lines over 75% utilized	-0.19	-15.17	<.0001	
Number of Inquiries	-0.40	-11.22	<.0001	
Number of Inquiries <6 months	0.15	1.82	0.0689	
Number of Installment Trades opened <6 months	0.77	12.08	<.0001	
Number of Derogs over \$100	-1.22	-26.53	<.0001	
Charge offs in the last 24 months	-0.63	-4.87	<.0001	

*Accounts with VantageScores greater than 700 were not included in the model because they were deemed non-representative outliers.